

## SECTION 27 08 00.01 00

## COMMISSIONING OF COMMUNICATION SYSTEMS

## PART 1 GENERAL

## 1.1 SUMMARY

This Section includes commissioning (Cx) process requirements for the following communications system components, systems, assemblies, and equipment.

- a. Outside Plant (OSP) cabling and terminations.
- b. Building telecommunications distribution cabling and terminations.
- c. Cable television distribution cabling and terminations.

## 1.2 RELATED REQUIREMENTS

Refer to Section 01 91 00.01 15 COMMISSIONING for general Cx process requirements, definition of Cx team members, and delineation of responsibilities.

Section 27 05 14.01 00 CABLE TELEVISION PREMISES DISTRIBUTION SYSTEMS for installation and termination acceptance tests.

Section 27 10 00.01 00 BUILDING TELECOMMUNICATIONS CABLING SYSTEM for installation and termination acceptance, verification, and performance tests.

Section 33 82 00.01 00 TELECOMMUNICATIONS OUTSIDE PLANT (OSP) for pre-installation and acceptance tests.

For construction checklists, comply with requirements in various Division 27 Sections specifying electrical systems, system components, equipment, and products.

## 1.3 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

## NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA)

NECA/BICSI 568	(2006) Standard for Installing Building Telecommunications Cabling
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## 1.4 DEFINITIONS

## 1.4.1 BoD

Basis-of-Design Document, as defined in Section 01 91 00.01 15 COMMISSIONING.

## 1.4.2 Cx

Commissioning, as defined in Section 01 91 00.01 15 COMMISSIONING.

## 1.4.3 CxA

Commissioning Authority, as defined in Section 01 91 00.01 15 COMMISSIONING.

## 1.4.4 CxC

**AM#9**...Commissioning Specialist for Construction...**AM#9**, as defined in Section 01 91 00.01 15 COMMISSIONING.

## 1.4.5 CxG

USACE Commissioning Specialist, as defined in Section 01 91 00.01 15 COMMISSIONING.

## 1.4.6 CCR

Contractor's Commissioning Representative, as defined in Section 01 91 00.01 15 COMMISSIONING.

## 1.4.7 OPR

Owner's Project Requirements , as defined in Section 01 91 00.01 15 COMMISSIONING.

## 1.4.8 Systems, Assemblies, Subsystems, Equipment, and Components

Where these terms are used together or separately, they shall mean "as-built" systems, assemblies, subsystems, equipment, and components.

## 1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submittals with an "S" designation following the "G" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29.01 00 SUSTAINABILITY REPORTING. Other designations following the "G" designation identify the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00.01 00 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Construction Checklist Review; G, CBJM

SD-07 Certificates

Testing Equipment and Instrumentation  
Equipment Manufacturers' Proprietary Instrumentation and Tools

## 1.6 CONSTRUCTION CHECKLISTS

Draft construction checklists created by CxA will be provided for Contractor review prior to creation and distribution of the final Construction Checklists. Final versions will incorporate Contractor

comments and information on approved submittals..

Provide comments on the material, installation, and performance test checklists for systems, assemblies, subsystems, equipment, and components to be part of the Cx process and according to requirements in Section 01 91 00.01 15 COMMISSIONING.

Construction Checklists shall include, but are not limited to, installation checks, startup, performance verification test, endurance tests and performance test demonstration as described in the following:

- a. NECA/BICSI 568, Annex A: Field Test Requirements.
- b. Section 27 05 14.01 00 CABLE TELEVISION PREMISES DISTRIBUTION SYSTEMS performance verification and acceptance tests.
- c. Section 27 10 00.01 00 BUILDING TELECOMMUNICATIONS CABLING SYSTEM performance verification and acceptance tests.
- d. Section 33 82 00.01 00 TELECOMMUNICATIONS OUTSIDE PLANT (OSP) performance verification and acceptance tests.

#### 1.7 QUALITY ASSURANCE

##### 1.7.1 Testing Equipment and Instrumentation Quality and Calibration

Testing equipment and instrumentation shall be:

- a. Capable of testing and measuring performance within the specified acceptance criteria.
- b. Calibrated at manufacturer's recommended intervals with current calibration tags permanently affixed to the instrument being used.
- c. Maintained in good repair and operating condition throughout duration of use on Project.
- d. Recalibrated/repaired if dropped or damaged in any way since last calibrated.

##### 1.7.1.1 Equipment Manufacturers' Proprietary Instrumentation and Tools

For each instrument or tool, identify the following:

- (1) Instrument or tool identification number.
- (2) Equipment schedule designation of equipment for which the instrument or tool is required.
- (3) Manufacturer, make, model, and serial number.
- (4) Calibration history, including certificates from agencies that calibrate the instrument or tool, where appropriate.

Include a separate list of proprietary test instrumentation and tools in operation and maintenance manuals.

Electrical proprietary test instrumentation and tools become property of the Government at the time of Substantial Completion.

## PART 2 PRODUCTS

Not Used

## PART 3 EXECUTION

## 3.1 CONSTRUCTION CHECKLIST REVIEW

Review and provide written comments on draft construction checklists. CxA will create required draft construction checklists and provide them to Contractor. Return draft construction checklist review comments within 10 days of receipt.

When review comments have been resolved, the CxA will provide final construction checklists, marked "Approved for Use, (date)." Use only construction checklists marked "Approved for Use, (date)."

## 3.2 COMMISSIONING TESTING PREPARATION

Certify that telecommunication and cable television systems, subsystems, and equipment have been installed, calibrated, and started and that they are operating according to the Contract Documents and approved shop drawings and submittals.

## 3.3 COMMISSIONING TEST CONDITIONS

Perform tests using design conditions and with equipment in final design configuration, whenever possible. Simulated conditions may, with approval of the Contracting Officer, be imposed using temporary connection when it is impractical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate signals. Set simulated conditions as directed by CxA and document simulated conditions and methods of simulation.

After tests, return configurations and settings to normal operating conditions. Cx test procedures may direct that connections or configurations may be altered when simulating conditions is impractical.

If tests cannot be completed because of a deficiency outside the scope of the system, document the deficiency and report it to the Contracting Officer. After deficiencies are resolved, reschedule tests.

## 3.4 COMMISSIONING TESTS FOR COMMUNICATION SYSTEMS

Measure capacities and effectiveness of systems, assemblies, subsystems, equipment, and components, including operational and control functions, to verify compliance with acceptance criteria.

Test systems, assemblies, subsystems, equipment, and components' operating modes, responses to abnormal conditions, and response according to acceptance criteria.

Coordinate schedule with, and perform Cx activities at the direction of, CxG.

Comply with construction checklist requirements, including material verification, installation checks, startup, and performance tests requirements specified in Sections specifying communications systems and

equipment.

Provide technicians, instrumentation, tools, and equipment to perform and document the following:

- a. Construction checklist verification.
- b. Construction checklist verification test demonstrations.
- c. Cx functional tests.
- d. Cx functional test demonstrations.

#### 3.4.1 Verification of Television Distribution System Operation

Prerequisites	
	Acceptance of results of test reports specified in Section 27 05 14.01 00 CABLE TELEVISION PREMISES DISTRIBUTION SYSTEMS.
Components and Systems To Be Tested	
	Television distribution system cabling and equipment.
Test Purpose	
	Verify operation of television distribution system.
Test Conditions	
	Complete all termination and testing of television distribution system cabling and equipment.
Acceptance Criteria	
	Successful completion of all tests and verifications required by Section 27 05 14.01 00 CABLE TELEVISION PREMISES DISTRIBUTION SYSTEMS and Communications Cx Construction Checklist and Functional Performance Tests.

##### 3.4.1.1 Television Distribution System Training Requirements

Contractor shall provide minimum four hours training in accordance with Section 01 78 23.01 00 OPERATION AND MAINTENANCE DATA and Section 01 91 00.01 15 COMMISSIONING to cover basic system architecture, operations, and maintenance.

#### 3.4.2 Verification of Telecommunications System Operation

Prerequisites	
	Acceptance of results of test reports specified in Section 27 10 00.01 00 BUILDING TELECOMMUNICATIONS CABLING SYSTEM and Section 33 82 00.01 00 TELECOMMUNICATIONS OUTSIDE PLANT (OSP).

Components and Systems To Be Tested	
	Telecommunications distribution system cabling and equipment.
Test Purpose	
	Verify operation of telecommunications distribution system.
Test Conditions	
	Complete all termination and testing of telecommunications distribution system cabling and equipment.
Acceptance Criteria	
	Successful completion of all tests and verifications required by Section 27 10 00.01 00 BUILDING TELECOMMUNICATIONS CABLING SYSTEM and Section 33 82 00.01 00 TELECOMMUNICATIONS OUTSIDE PLANT (OSP) and Communications Cx Construction Checklist and Functional Performance Tests.

#### 3.4.2.1 Telecommunications System Training Requirements

Contractor shall provide minimum four hours training in accordance with Section 01 78 23.01 00 OPERATION AND MAINTENANCE DATA and Section 01 91 00.01 15 COMMISSIONING to cover basic system architecture, operations, and maintenance.

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